USER MANUAL

Hybrid

Solar Inverter

EASUN POWER

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1 About This Manual

1.1 Purpose

This manual describes the assembly, installation, operation and troubleshooting of this unit. Please read this manual carefully before installations and operations, Keep manual for future reference.

1.2 Scope

This manual provides safety and installation guidelines as well as information on tools and wiring.

2 Safety Instructions

WARNING: This chapter contains important safety and operating instructions. Read and keep this manual for future reference.

1. Before using the unit read all instructions and cautionary markings on the unit, the batteries and all appropriate sections of this manual.
2. **CAUTION**-To reduce risk of injury, charge only deep-cycle lead acid type rechargeable batteries. Other types of batteries may burst, causing personal injury and damage.
3. Do not disassemble the unit Take it to a qualified service center when service or repair is required. Incorrect re-assembly may result in a risk of electric shock or fire.
4. To reduce risk of electric shock, disconnect all wirings before attempting any maintenance or cleaning. Turning off the unit will not reduce this risk.
5. **CAUTION**-Only qualified personnel can install this device with battery.
6. **NEVER** charge a frozen battery.
7. For optimum operation of this inverter/charger, please follow required spec to select appropriate cable size. It's very important to correctly operate this inverter/charger.
8. Be very cautious when working with metal tools on or around batteries.A potential risk exists to drop a tool to spark or short circuit batteries or other electrical parts and could cause an explosion.
9. Please strictly follow installation procedure when you want to disconnect AC or DC terminals, Please refer to INSTALLATION section of this manual for the details
10. One piece of 150A fuse is provided as over-current protection for the battery supply.
11. GROUNDING INSTRUCTIONS -This inverter/ charger should be connected to a permanent grounder wiring system. Be sure to comply with local requirements and regulation to install this inverter.
12. NEVER cause AC output and DC input short circuited. Do NOT connect to the mains when DC input short circuits.
13. **Warning!!** Only qualified service persons are able to service this device. If errors still persist after following troubleshooting table, please send this inverter/charger back to local dealer or service center for maintenance.

3 Introduction

This is a multi-function Inverter/charger, combining functions of inverter, solar charger and battery charger to offer uninterruptible power support with portable size. Its comprehensive LCD display offers user-configurable and easy-accessible button operation such as battery charging current, AC/solar charger priority, and acceptable input voltage based on different applications.

3.1 Features

- Pure sine wave inverter
- Configurable input voltage range for home appliances and personal computers via LCD setting
- Configurable battery charging current based on applications via LCD setting
- Configurable AC/Solar Charger priority via LCD setting
- Compatible to mains voltage or generator power
- Auto restart while AC is recovering
- Overload/Over temperature/short circuit protection
- Smart battery charger design for optimized battery performance
- Cold start function

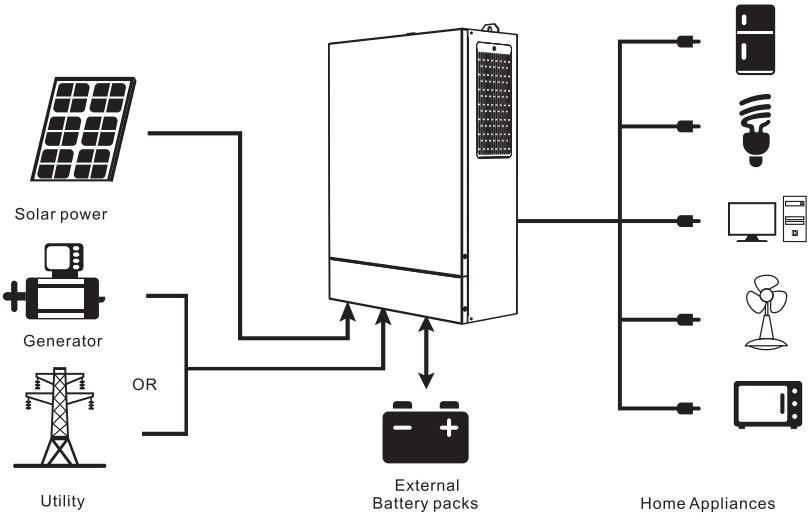
3.2 Basic System Architecture

The following illustration shows basic application for this inverter/charger.It also includes following devices to have a complete running system:

- Generator or Utility
- PV modules

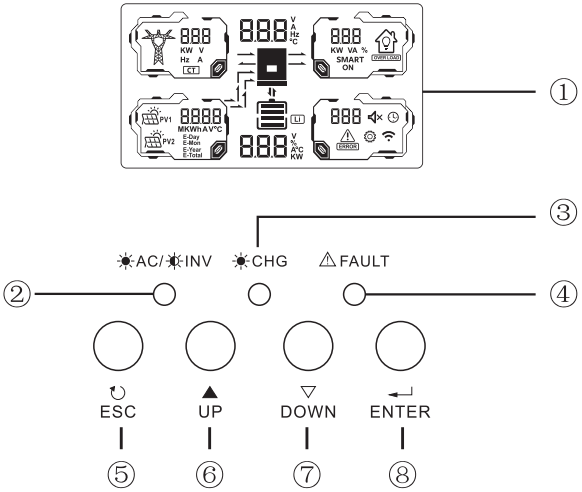
Consult with your system integrator for other possible system architectures depending on your requirements.

This inverter can power all kinds of appliances in home or environment,including motor-type appliances such as tube light, fan, refrigerator and air conditioner.



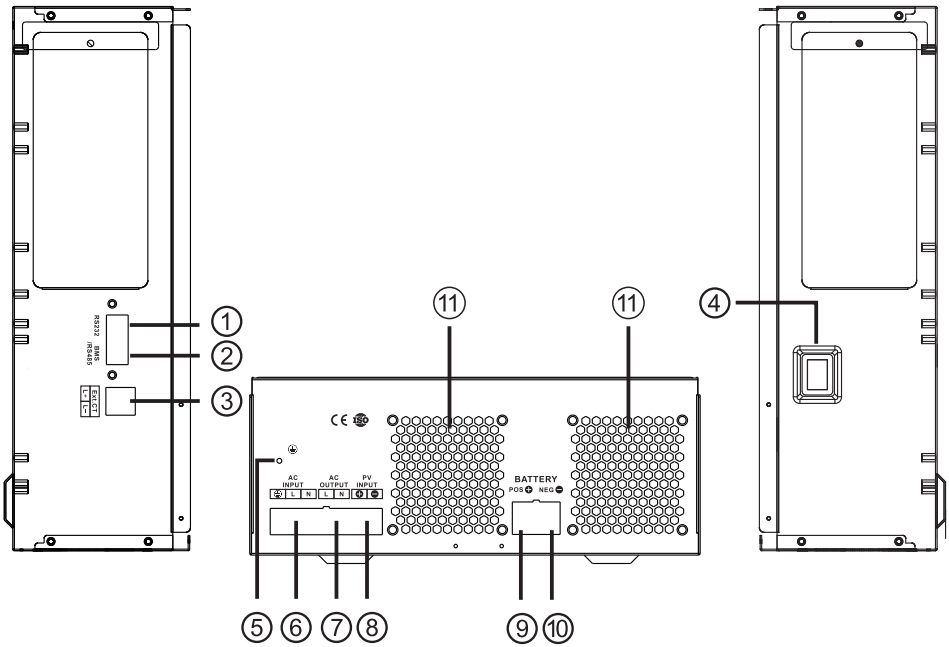
3.3 Product Overview

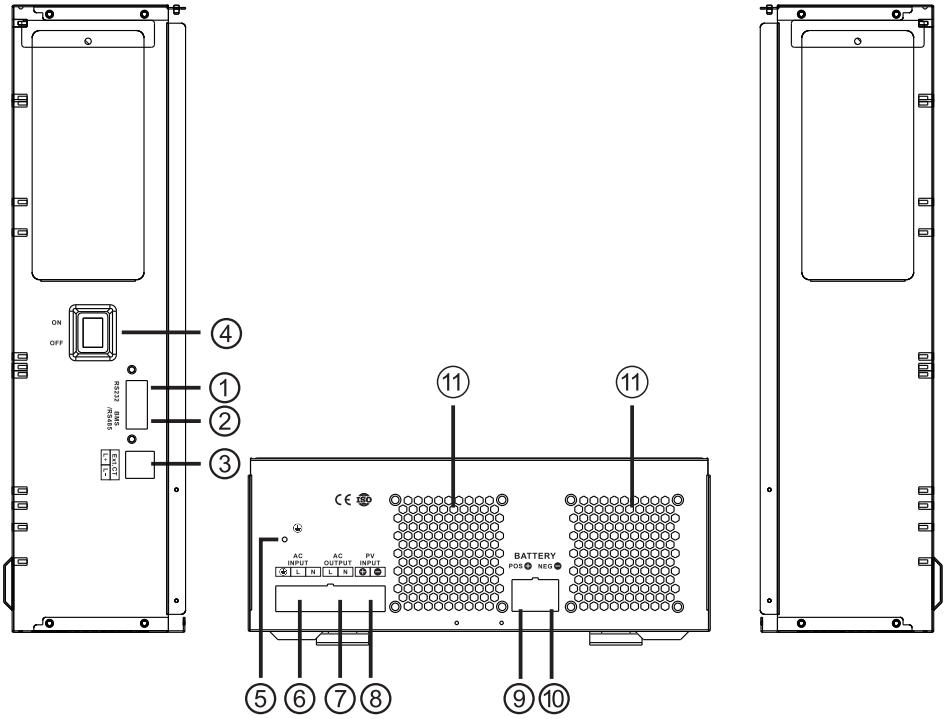
3.3.1 LCD Screen



1.....LCD display
2.....Status indicator
3.....Charging indicator
4.....Fault indicator
5.....ESC
6.....UP
7.....DOWN
8.....ENTER

3.3.2 Back Panel





1.....RS232 Communication Port

2.....BMS/RS485 Communication Port

3.....CT Signal port

4.....Power ON/OFF Switch

5.....Output ground wire

6.....AC Input

7.....AC output

8.....PV Input

9.....Battery Terminal Positive

10...Battery Terminal Negative

11...Fan

4 INSTALLATION

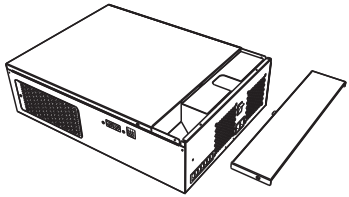
4.1 Unpacking and Inspection

Before installation, please inspect the unit. Be sure that nothing inside the package is damaged. You should have received the following items inside of package:

- The unit x 1
- User manual 1

4.2 Preparation

Before connecting all please take off bottom cover by removing two screws as shown below.



4.3 Mounting the Unit

Consider the following points before selecting where to install:

※ Do not mount the inverter on flammable construction materials.

※ Mount on a solid surface

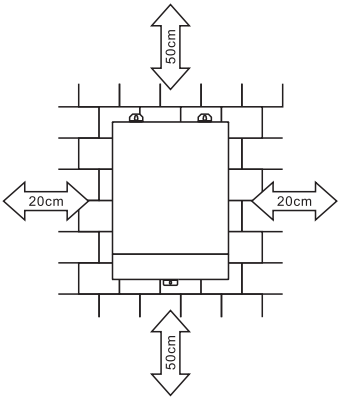
※ Install this inverter at eye level in order to allow the LCD display to be read at all times.

※ For proper air circulation to dissipate heat, allow a clearance of approx. 20 cm to the side and approx. 50 cm above and below the unit.

※ The ambient temperature should be within the range of 20～35°C to ensure optimal operation

※ The recommended installation position is to be adhered to the wall vertically.

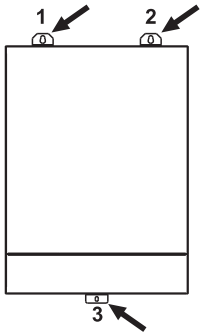
※ Be sure to keep other objects and surfaces as shown in the diagram to guarantee sufficient heat dissipation and to have enough space for removing wires.



SUITABLE FOR MOUNTING ON CONCRETE OR OTHER NON-COMBUSTIBLE SURFACE ONLY.

Install the unit by screwing three screws.

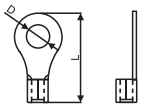
- Use M4*30.



4.4 Battery Connection

CAUTION: For safety operetion and reguation compliance,it's requested to install a separate DC over-current protector or disconnect device between battery and inverter.It I may not be requested to have a disconnect device in some applications, however, it's still requested to over-current protection installed. Please refer to typical amperage in below table as required fuse or breaker size.

Ring terminal:



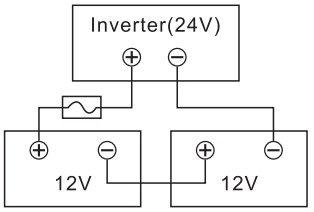
WARNING! All wiring must be performed by be qualified personnel.
WARNING! It's very important for system safety and efficient operation to use appropriate cable for battery connection. To reduce risk of injury, plese use the proper recommended cable and terminal size as below.

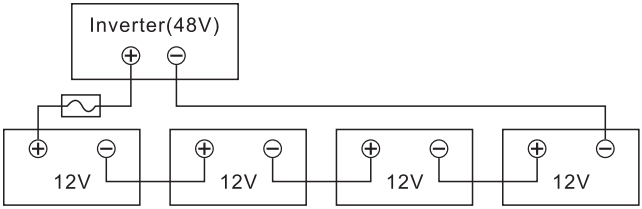
Recommended battery cable and terminal size:

Rated Capacity	Typical Amperage	Battery capacity	Wire Size	Ring Terminal			Torque value
				Cable(mm^2)	Dimensions		
					D(mm)	L(mm)	
4KVA	138A	200AH	2*4AWG	25	8.4	33.2	5Nm

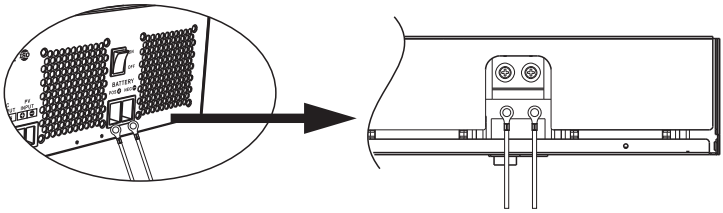
please follow below steps to implement battery connection:

1.Assemble battery ring terminal based on recommended battery cable and terminal size.





2. Insert the battery wires flatly into battery connectors of inverter and make sure the bolts are tightened with torque of 2 Nm in clockwise direction. Make sure polarity at both the battery and the inverter/charge is correctly connected and conductors are tightly screwed into the battery terminals. Recommended tool: # 2 Pozi Screwdriver



⚠	**WARNING:** Shock Hazard Installation must be performed with care due to high battery voltage in series.

⚠	**CAUTION!!** Before making the final DC connection or closing DC breaker/disconnector, be sure positive(+) must be connected to positive(+) and negative(-) must be connected to negative (-).

4.5 AC Input Output Connection

CAUTION!! Before connecting to AC input power source, please Install a separate AC breaker between inverter and AC input power source. This will ensure the Inverter can be disconnected during maintenance and fully protected from over current of AC input. The recommended spec of breaker is 32A for 24V system and 63A for 48V system .

CAUTION! ! There are two terminal blocks with " IN " and " OUT " markings. Please do NOT mis-connect input and output connectors.

WARNING! All wiring must be performed by qualified personnel.

WARNING! It's very important for system safety and efficient operation to use appropriate cable for AC input connection. To reduce risk of injury, please use the proper recommended cable size as below.

Suggested cable requirement for AC wires

Rated Capacity	Gauge	Torque value
4KVA	12AWG	1.2~1.6Nm

Please follow below steps to implement AC input/ output connection

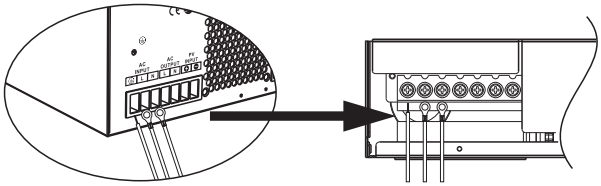
1. Before making AC input/output connection be sure to open DC protector or disconnector first.
2. Remove insulation sleeve 10mm for six conductors. And shorten phase L and neutral conductor N3 mm.

3. Insert AC input wires according to polarities indicated on terminal block and tighten the terminal screws. Be sure to connect PE protective conductor(⏚)first.

⏚→**Ground(yellow-green)**

L→LINE(brown or black)

N→Neutral (blue)



⚠	**WARNING:** Be sure that AC power source is disconnected before attempting to hardwire it to the unit.

4. Make sure the wires are securely connected

CAUTION: Appliances such as air conditioner are required at least 2~3 minutes to restart because it's required to have enough time to balance refrigerant gas inside of circuits. If a power shortage occurs and recovers in a short time, it will cause damage to your connected appliances. To prevent this kind of damage, please check manufacturer of air conditioner if it's equipped with time-delay function before installation. Otherwise, this inverter/ charger will trig overload fault and cut off output to protect your appliance but sometimes it still causes internal damage to the air conditioner.

4.6 PV Connection

PV Connection(Only apply for the model with solar charger)

CAUTION: Before connecting to PV modules, please install **separately** a DC circuit breaker between inverter and PV modules.

WARNING! All wiring must be performed by a qualified personnel.

WARNING! It's very important for system safety and efficient operation to use appropriate cable for PV module connection. To reduce risk of injury, please use the proper recommended cable size as below.

Typical Amperage	Gauge	Torque Value
30A	12AWG	1.4~1.6Nm

PV module selection:

When choosing the right PV module, be sure to first consider the following requirements:

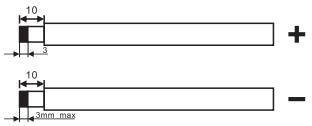
The open circuit voltage (Voc) of the PV modules does not exceed the maximum PV array open circuit voltage of the inverter. The maximum supply voltage of the PV modules should be close to the optimal PV access voltage range of the inverter for best performance. If one PV module cannot meet this requirement, it is necessary to connect multiple PV modules in series.

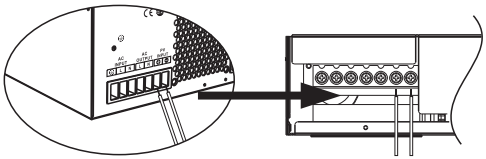
Model	ISolar-SMT-4K-Wifi
PV Charging Mode	MPPT
MAX.PV Input Power	5000W
MPPT Tracking Range	60~500Vdc
Best Voltage	300~400V
MAX.PV Input Voltage	500Vdc
PV Max Input Current	15A
MAX.PV Charging Current	120A
MAX.AC Charging Current	100A
MAX.Charging Current	120A

PV Module Wire Connection

Please follow below steps to implement PV module connection:

1. Remove insulation sleeve 10 mm for positive and negative conductors.
2. Suggest to put bootlace ferrules on the end of positive and negative wires with a proper crimping tool
3. Fix wire cover to the inverter with supplied screws as shown in below chart.





4. Check correct polarity of wire from PV modules and PV input connectors. Then,connect positive pole(+) of connection wire to positive pole(+) of PV input connector. Connect negative pole (-)of connection wire to negative pole(-) of PV input connector. Screw two wires tightly in clockwise direction. Recommended tool: 4mm blade screwdriver.

The CT Operation Guide

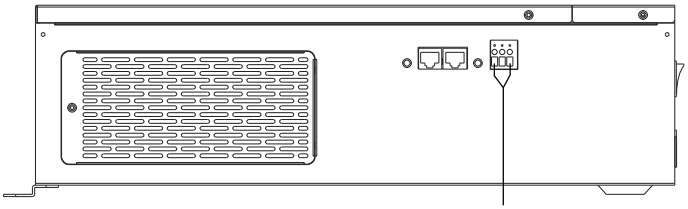
With CT connected, hybrid inverter can be easlly integrated into the existing household system. It's to arrange self. consumption via CT to control power generation and battery charging of the Inverter.

1. Single commissioning

Step 1. Power off the inverter and connect the external CT by using the tool accessory to install on the spring terminal block. Be noted the mark of current flow direction on the CT should point to the Inverter and the polarity on connecting CT wires on the terminal block should be followed as “L+” VS red wire and “L-” VS black wire.

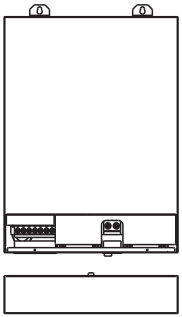
Step 2. Power on the inverter.

Step 3. Enter LCD setting on the inverter with CT sensor connected and set CT function to“ PEC”.



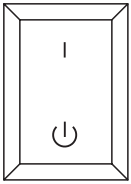
4.7 Final Assembly

After connecting all wirings, please put bottom cover back by screwing two screws as shown below.



5 OPERATION

5.1 Power ON/OFF



Once the unit has been properly installed and the batteries are connected well,simply press On/Off switch (located on the button of the case)to turn on the unit.

5.1.1 Steps to start up

Connect the battery that meets the requirements (battery voltage needs to beyond 23V) or AC (AC needs to confirm the suitable input range depend on the output mode), then you can start up the inverter.

➢ Mains power on

Connect to normal AC power, press the switch, the system will automatically turn on. If you set AC output power priority, after waiting for a period of time, the panel will display AC mode that represents turn on the machine successfully, then will enter the AC mode.

When the normal mains power is connected and press the power-on button then the system will automatically power on. If it is set as AC output priority, after a period of time, the panel will display the AC mode to indicate that the power-on is complete and enter the AC mode.

➢ Battery boot

Connect to battery, press the power-on button to establish a working power source.

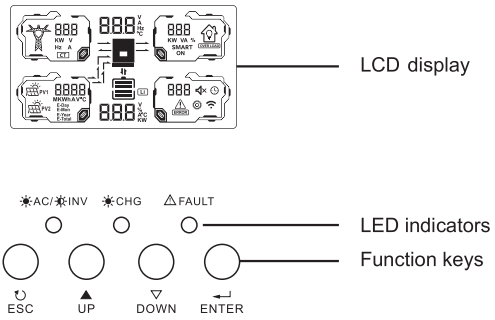
The system will automatically turn on, after waiting for a period of time, the panel will display battery mode that represents turn on the machine successfully, then will enter the battery mode.

5.1.2 Shutdown steps

When the system is in battery mode or AC mode output, press the switch again, then the system will be turned off.

5.2 Operation and Display Panel

The operation and display panel, shown in below chart , is on the front panel of the inverter. It includes three indicators , four function keys and a LCD display, indicating the operating status and input/output power information.



LED Indicator

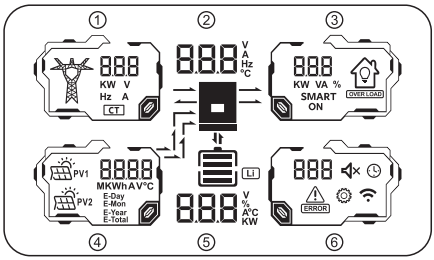
LED Indicator			Messages
AC/INV	Green	Solid On	Output is powered by utility in Line mode.
		Flashing	Output is powered by battery or PV in battery mode.
CHG	Yellow	Solid On	Battery is fully charged.
		Flashing	Battery is charging.
FAULT	Red	Solid On	Fault occurs in the inverter.
		Flashing	Warning condition occurs in the inverter.

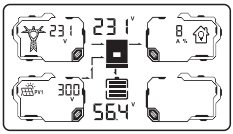
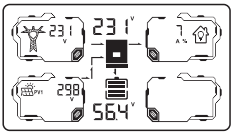
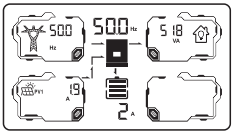
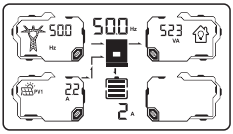
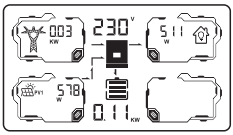
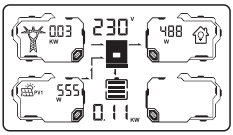
Function Keys

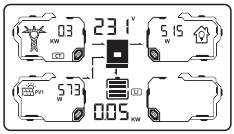
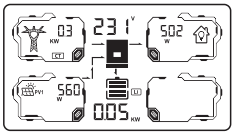
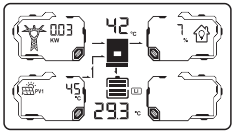
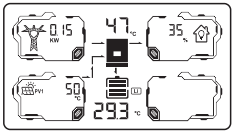
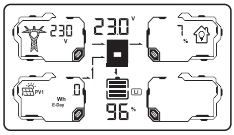
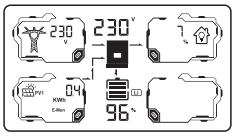
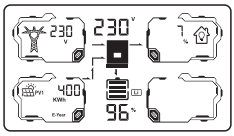
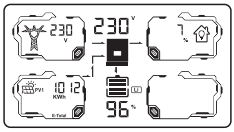
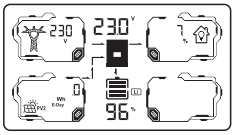
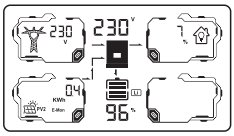
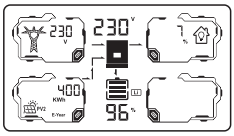
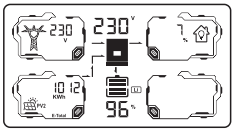
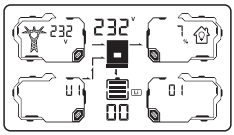
Function Key	Description
ESC	To exit setting mode
UP	To go to previous selection
DOWN	To go to next selection
ENTER	To confirm the selection in setting mode or enter setting mode

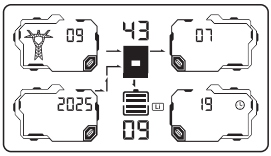
Display Setting

The LCD display information will be switched in turns by pressing "UP" or "DOWN" key. The selectable information is switched as below order: voltage, frequency,current, power, Temperature, firmware version,date.

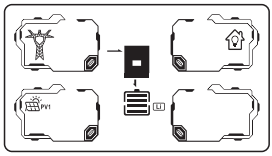
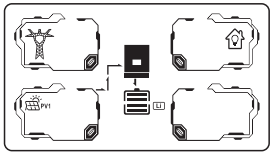
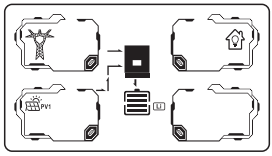
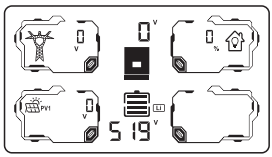


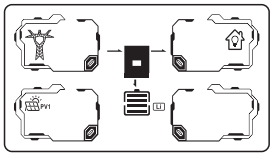
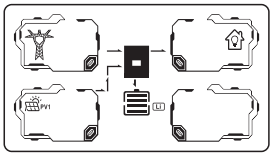
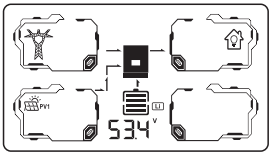
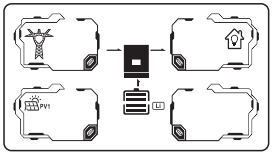
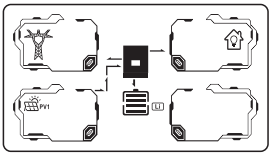
Select item	LCD display	
① AC Input voltage (it indicates that the input voltage of the generator is displayed at this time, and the power and frequency displayed after turning the page are also the input parameters of the generator.) ② Output voltage ③ Load percentage ④ Left:PV1 input voltage Right:PV2 input voltage ⑤ Battery voltage ⑥ Warning or Fault code(Default Display Screen)		
①AC Input frequency ②Output frequency ③Load power in VA ④Left:PV1 input current Right: PV2 input current ⑤Battery current ⑥ Warning or Fault code		
① AC input power in Watts ② Output voltage ③ Load power in Watts ④ Left:PV1 input power in Watts Right:PV2 input power in Watts ⑤ Battery in Watts ⑥ Warning or Fault code		

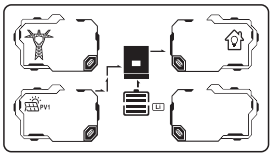
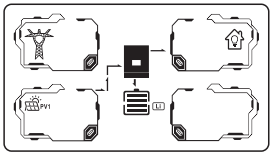
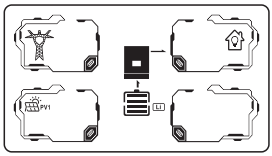
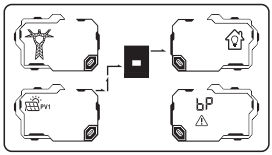
Select item	LCD display	
① External CT AC input power in Watts (If the external CT is reversed, a "-" will be displayed in front of the power figure.) ② Output voltage ③ Apparent power ④ Left:PV1 input power in Watts Right:PV2 input power in Watts ⑤ Battery in Watts ⑥ Warning or Fault code		
① AC input power in Watts ② Inverter temperature ③ Load percentage ④ Left:PV1 temperature Right:PV2 temperature ⑤ Battery temperature ⑥ Warning or Fault code		
① AC Input voltage ② Output voltage ③ Load percentage ④ Left:PV1 energy generated this day /this Monthly/this year/total Right:PV2 energy generated this day /this Monthly/this year/total ⑤ Battery percentage ⑥ Warning or Fault code(Default Display Screen)	   	   
Main board firmware version ① AC Input voltage ② Output voltage ③ Load percentage ④⑤⑥Firmware version (CPU:U1.00.01)		

Select item	LCD display
① hour ② minute ③ second ④ year ⑤ month ⑥ day (09:43:07 September 19 2025)	

Operating Mode Description

Operating mode	Behaviors	LCD display
Standby mode Note: *Standby mode: The inverter is not turned on yet but at this time, the inverter can charge battery without AC output. *Power swing mode: If enabled, the output of inverter will be off when connected load is pretty low or not detected.	No output power, solar or utility charger available	Battery is charged by utility. 
		Battery is charged by PV energy. 
		Battery is charged by utility and PV energy. 
		No charging. 

Operating mode	Behaviors	LCD display
Line mode	Output power from utility. Charger available	Utility charges battery and provides power to load. 
		PV energy,battery power and utility provide power to load. 
		If “PEC”-is-selected as output source priority, PV energy and battery will support the output load with utility. 
		If "PEC"is selected as output source priority, Power from battery and utility. 
		If "SUF"is selected as output source priority, The remaining PV energy can be supplied to the grid. 

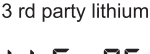
Operating mode	Behaviors	LCD display
Battery mode	Output power from battery or PV	PV energy and battery energy supply power to the load. 
		The PV energy power to the load and has remaining energy to charge the battery 
		Battery provides power to the load. 
Only PV mode	Output power from PV	PV provides power to the load. 

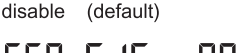
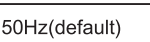
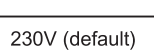
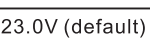
5.3 LCD Setting

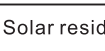
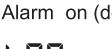
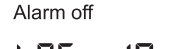
After pressing and holding ENTER button for 3 seconds, the unit will enter setting mode. Press "UP" or "DOWN" button to select setting programs. And then, press "ENTER" button to confirm the selection or ESC button exit.

Setting Programs:

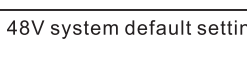
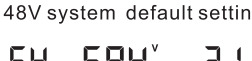
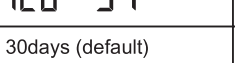
Program	Description	Selectable option	
00	Exit setting mode	Escape ESC 00	
01	Output source priority selection	SUb 01	Solar energy provides power to the loads as first priority. If solar energy is not sufficient to power all connected loads, Utility energy will supply power to the loads at the same time.
		SbU 01	Solar energy provides power to the loads as first priority. If solar energy is not sufficient to power all connected loads, battery energy will supply power to the loads at the same time. Utility provides power to the loads only when battery voltage drops to either low-level warning voltage or the setting point in program 12 or solar and battery is not sufficient.
		SUF 01	If solar energy is sufficient to all connected loads and charge battery, the solar energy could feedback to the grid (sell power to grid). If solar energy is not sufficient to power all connected loads, Utility energy will supply power to the loads at the same time.
		PEC 01	The units will not only provide power to the connected load but also give power to connected home load. If PV power and battery power is insufficient, it will take grid energy as supplement. The units will not sell power to grid. In this mode, a CT can be used. The installation method of the CT please refer to chapter about CT connection. The external CT will detect power flowing back to the grid and will reduce the power of the inverter only to supply the local load, charge battery and home load.

02	Maximum charging current: To configure total charging current for solar and utility chargers. (Max. charging current = utility charging current + solar charging current)	60A(default) 	Setting range is from 10A to maximum charging current. Increment of each click is 10A.
03	AC input voltage range	Appliances (default) 	If selected, acceptable AC input voltage range will be within 90-280VAC.
		UPS 	If selected, acceptable AC input voltage range will be within 170-280VAC.
05	Battery type	AGM (default) 	Flooded
		User-Defined 	If "User-Defined" is selected, battery charge voltage, low DC cut-off voltage and dual cut -off voltage can be set up in program 24,26,27,29 and 61.
		LIA-protocol compatible battery 	If selected,programs of 24,26,27 and 29 will be automatically set up. No need for further setting.
		Pylontech battery 	
		Techfine battery 	
		Growatt battery 	
		Felicity battery 	
		LIB-protocol compatible battery 	Select “LIB if using Lithium battery compatible to Lib protocol. If selected, programs of 26,27 and 29 will be automatically se up. No meed for further setting.
		3 rd party lithium battery 	If selected, programs of 26,27 and 29 will be automatically set up. No need for further setting. Please contact the battery supplier for installation procedure.

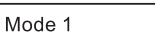
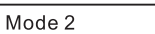
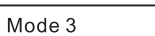
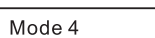
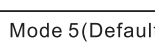
06	Auto restart when overload occurs	Restart disable(default) 	Restart enable
07	Auto restart when over temperature occurs	Restart disable (default) 	Restart enable
08	ECO function: System will temporarily stop when the load is low in battery mode.	disable (default) 	
		enable 	
09	Output frequency	50Hz(default) 	60Hz
10	Output voltage	220V 	230V (default) 
		240V 	
11	Maximum utility charging current Note: If setting value in program 02 is smaller than that in program in 11, the inverter will apply charging current from program 02 for utility charger.	30A(default) 	Setting range is 2A, then from 10A to max.AC charging current. Increment of each click is 10A.
12	Setting voltage point back to utility source when selecting“SBU priority” in program 01.	Available options in 24 system model:	
		23.0V (default) 	Setting range is from 22V to 25.5V. Increment of each click is 0.5V.
		Available options in 48 system model:	
		46V (default) 	Setting range is from 44V to 51V. Increment of each click is 1V.

<table>
<tr><td rowspan="6">13</td><td rowspan="6">Setting voltage point back to battery mode when selecting“SBU priority”in program 01.</td><td colspan="2">Available options in 24 system model:</td></tr>
<tr><td>Battery fully charged
 </td><td>27V(default)
 </td></tr>
<tr><td colspan="2">Setting range is from 24V to 29V. Increment of each click is 0.5V.</td></tr>
<tr><td colspan="2">Available options in 48 system model:</td></tr>
<tr><td>Battery fully charged
 </td><td>54V (default)
 </td></tr>
<tr><td colspan="2">Setting range is from 48V to 58V. Increment of each click is 1V.</td></tr>
<tr><td rowspan="6">16</td><td rowspan="6">Charger source priorit:
To configure charger source priority</td><td colspan="2">If this inverter/charger is working in Line, Standby or Fault mode,charger source can be programmed as below:</td></tr>
<tr><td>Solar first
 </td><td>Solar energy will charge battery as first priority.
Utility will charge battery only when solar energy is not available.</td></tr>
<tr><td>Solar and Utility(default)
 </td><td>Solar energy and utility will charge battery at the same time.</td></tr>
<tr><td>Only Solar
 </td><td>Solar energy will be the only charger source no matter utility is available or not.</td></tr>
<tr><td>Solar residual
  </td><td>Solar energy will support.
all connected loads as first priority, the residual energy will charge battery</td></tr>
<tr><td colspan="2">If this inverter/charger is working in Battery mode, only solar energy can charge battery. Solar energy will charge battery if it's available and sufficient.</td></tr>
<tr><td>17</td><td>Battery reboot voltage</td><td>default:
 </td><td>If in SOC mode, when the machine will restart and resume operation until the PV charging reaches the set value after the battery is low and the device shuts down.</td></tr>
<tr><td>18</td><td>Alarm control</td><td>Alarm on (default)
  </td><td>Alarm off
  </td></tr>
</table>

19	Auto return to default display screen	Return to default display screen (default) ESP 19	If selected, no matter how users switch display screen, it wil automatically return to defaultl display screen (Input voltage /output voltage) after no button is pressed for 1 minute.
		Stay at latest screen tEP 19	If selected, the display screen will stay at latest screen user finally switches.
20	Backlight control	Backlight on (default) LON 20	Backlight off LOF 20
22	Beeps while primary source is interrupted	Alarm on (default) AON 22	Alarm off AOF 22
23	Overload bypass: When enabled, the unit will transfer to line mode if overload occurs in battery mode.	Bypass disable (default) byd 23	Bypass enable byE 23
24	Battery low voltage ● If battery power is only power source availableinverter will alarm.	Battery low voltage 44.0V LOu 440v 24	
		Setting range is from 20.0V-27.0V for 24V system and 40.0V-54.0V for 48V system.	
25	Record fault code	Record enable (default) FEn 25	Record disable Fbs 25
26	Bulk charging voltage (C.V voltage)	24V system default setting:28.2V Cu 28.2v 26	
		48V system default setting:56.4V Cu 56.4v 26	
		If self-defined is selected in program 5,this program can be set up. Setting range is from 24.0V to 30.0V for 24V system and 48.0V to 60.0V for 48V system. Increment of each click is 0.1V.	
27	Floating charging voltage	24V system default setting:27.0V FLu 27.0v 27	
		48V system default setting:54.0V FLu 54.0v 27	

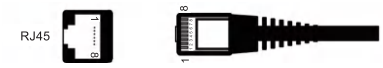
<table>
<tr><td rowspan="2">28</td><td rowspan="2">Reset factory setting</td><td colspan="2">default:
 </td></tr>
<tr><td colspan="2"> </td></tr>
<tr><td rowspan="3">29</td><td rowspan="3">Low DC cut-off voltage:
• If battery power is only power source availableinverter will shut down.
• If PV energy and battery power are available, inverter will charge battery without AC output.</td><td colspan="2">24V system default setting:21.0V
 </td></tr>
<tr><td colspan="2">48V system default setting:42.0V
  </td></tr>
<tr><td colspan="2">If self-defined is selected in program 5, this program can be set up.Setting range is from 20.0V to 26.0V for 24V system and 40.0V to 52.0V for 48V system.
Increment of each click is 0.1V Low DC cut-off voltage will be fixed to setting value no matter what percentage of load is connected.</td></tr>
<tr><td rowspan="2">30</td><td rowspan="2">Battery equalization</td><td>Battery equalization
 </td><td>Battery equalization disable (default)
 </td></tr>
<tr><td colspan="2">If “Flooded” or “User Defined” is selec ted in program05, this program can be set up.</td></tr>
<tr><td rowspan="3">31</td><td rowspan="3">Battery equalization voltage</td><td colspan="2">24V system default setting:29.2V
 </td></tr>
<tr><td colspan="2">48V system default setting:58.4V
  </td></tr>
<tr><td colspan="2">Setting range is from 24.0V to 30.0V for 24V system and 48.0V to 60.0V for 48V system. Increment of each click is 0.1V.</td></tr>
<tr><td>33</td><td>Battery equalized time</td><td>60min (default)
 </td><td>Setting range is from 5min to 900min.
Increment of each click is 5min.</td></tr>
<tr><td>34</td><td>Battery equalized timeout</td><td>120min (default)
 </td><td>Setting range is from 5min to 900min.
Increment of each click is 5min.</td></tr>
<tr><td>35</td><td>Equalization interval</td><td>30days (default)
  </td><td>Setting range is from 0 to 90 days.
Increment of each click is 1 day.</td></tr>
</table>

36	Equalization activated immediately	Enable AEn 36	Disable (default) AdS 36
		If equalization function is enabled in program 30, this program can be set up. If "Enable" is selected in this program, it's to activate battery equalization immediately and LCD main page will shows " Eq ", If "Disable" is selected, it will cancel equalization function until next activated equalization time arrives based on program 35 setting. At this time, " Eq " will not be shown in LCD main page.	
37	BMS Function Switch	off(default) bnS OFF 37 bnS On 37	Whether to enable the BMS communication function
38	Bat Soc Under Lock	bSU 10% 38	If any type of lithium battery is selected in program 5. BMS low voltage SOC value, if the BMS SOC value is lower than the set value, the inverter will shut down to protect the battery.
39	Bat Soc Turn To Ac	StG 20% 39	If any type of lithium battery is selected in program 5. When the working mode of the inverter is set to the battery priority mode, the inverter will be forced to enter the mains charging when the SOC of the BMS is lower than the set value.
40	Bat Soc Turn To Dc	Stb 95% 40	If any type of lithium battery is selected in program 5. When the working mode of the inverter is set to the battery priority mode, the inverter resumes the DC working mode when the SOC of the BMS is higher than the set value.
41	Bat Restart Soc	bSr 50% 41	If any type of lithium battery is selected in program 5. When the inverter is turned on, the SOC must be higher than the set value to work normally.
45	Reset PV energy storage	Notre set (Default) nrt 45	Reset rSt 45
46	Start charging time for AC charger	00:00(Default) StA 00.0H 46 The setting range of start charging time for AC charger is from 00:00 to 23:00, increment of each click is 1 hour.	
47	Stop charging time for AC charger	00: 00(Default) StO 00.0H 47 The setting range of scheduled Time for AC output on is from 00: 00 to 23:00,increment of each click is 1 hour.	

48	Scheduled time for AC output on	00: 00(Default) The setting range of scheduled Time for AC output off is from 00: 00 to 23:00,increment of each click is 1 hour.	
49	Scheduled time for AC output off	00: 00(Default) The setting range of scheduled Time for AC output off is from 00: 00 to 23:00,increment of each click is 1 hour.	
50	Set country customized regulations	Mode 1 	If selected, acceptable feed-in grid voltage range will be 195.5-253VAC. Acceptable feed-in grid frequency range will be 49-51Hz.
		Mode 2 	If selected, acceptable feed-in grid voltage range will be 184-264.5VAC. Acceptable feed-in grid frequency range will be 47.5-51.5Hz.
		Mode 3 	If selected, acceptable feed-in grid voltage range will be 184-264.5VAC. Acceptable feed-in grid frequency range will be 57-62Hz.
		Mode 4 	If selected, acceptable feed-in grid voltage range will be 170-264.5VAC. Acceptable feed-in grid frequency range will be 47.5-53.5Hz.
		Mode 5(Default) 	If selected, acceptable feed-in grid voltage range will be 100-280VAC. Acceptable feed-in grid frequency range will be 47.5-53.5Hz.
51	Time setting-Minute	For minute setting, the range is from 00 to 59. 	
52	Time setting-Hour	For hour setting, the range is from 00 to 23. 	
53	Time setting-Day	For day setting, the range is from 00 to 31. 	
54	Time setting-Month	For month setting, the range is from 1 to 12 	
55	Time setting-Year	For year setting, the range is from 16 to 99. 	
56	GRID-tie power	6.2KW 	Increment of each click is 200W.

58	Set the input power of the mains power	0.15KW(default) 2EP 0.15 KW 58	Setting range is from 0.01KW to 0.5KW.Increment of each click is 0.01KW.
59	Max battery discharge current setting	200(default) d IC 200 59	When the battery discharge current more than the setting value, the unit will be alarm.The setting range is from 20 to 200.
67	Output Open Time	dtA 00.0 67	The value ranges from 0 to 23.
68	Output Stop Time	dtO 00.0 68	The value ranges from 0 to 23.
71	Start time setting for power grid peak shaving	00:00(Default) LSA 00.0 71 The setting range of start time for power grid peak shaving is from 00:00 to 23:00, increment of each click is 1 hour.	In PEC mode, set the start time and stop time for the battery to sell electricity according to requirements.
72	Stop time setting for power grid peak shaving	00:00(Default) LSO 00.0 72 The setting range of stop time for power grid peak shaving is from 00:00 to 23:00, increment of each click is 1 hour.	

When the BMS/485 communication interface is externally connected, as shown in the following figure:



1----------485B
2----------485A
3/4/5/6/7/8--NC

Communication Connection

Please use supplied communication cable to connect to inverter and PC. Please install a monitoring software on the computer.

5.4 Battery Equalization Description

Equalization function is added into charge controller, It reverses the buildup of negative chemical effects like stratification, a condition where acid concentration is greater at the bottom of the battery than at the top. Equalization also helps to remove sulfate crystals that might have built up on the plates. If left unchecked, this condition, called sulfation, will reduce the overall capacity of the battery. Therefore, it's recommended to equalize battery periodically.

※ **How to Apply Equalization Function**

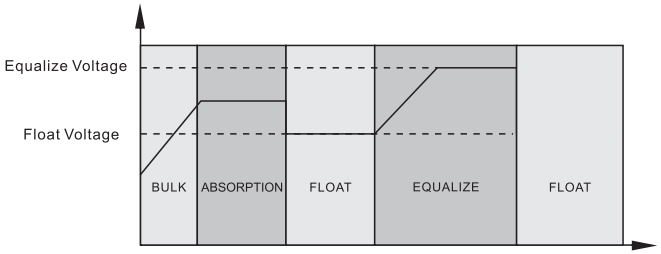
You must enable battery equalization function in monitoring LCD setting program 30 first. Then, you may apply this function in device by either one of following methods:

1.Setting equalization interval in program 35.

2.Active equalization immediately in program 36.

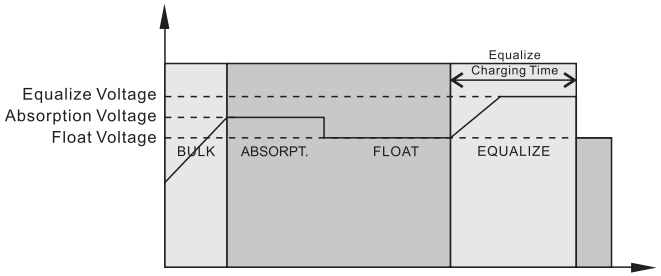
※ **When to Equalize**

In stage, when the setting equalization interval(battery equalization cycle) is arrived, or equalization is active immediately, the controller will start to enter Equalize stage.

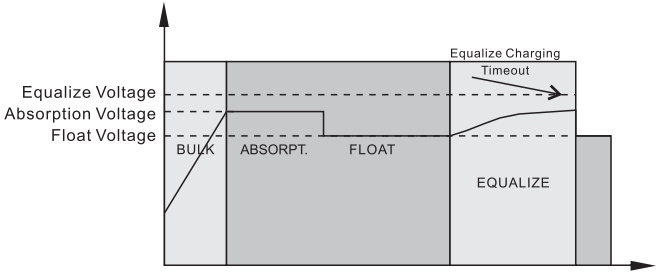


※ **Equalize charging time and timeout**

In Equalize stage, the controller will supply power to charge battery as much as possible until battery voltage raises to battery equalization voltage.Then,constant-voltage regulation is applied to maintain battery voltage at the battery equalization voltage. The battery will remain in the Equalize stage until setting battery equalized time is arrived.



However, in Equalize stage, when battery equalized time is expired and battery voltage doesn't rise to battery equalization voltage point, the charge controller will extend the battery equalized time until battery voltage achieves battery equalization voltage. If battery voltage is still lower than battery equalization voltage when battery equalized timeout setting is over, the charge controller will stop equalization and return to float stage.



5.5 Fault and alarm description

5.5.1 Faults Descriptions

➢ **Fault:** The inverter enters the fault mode, the red LED light is always on and the LCD displays the fault code.

Fault Reference Code

Fault Code	Fault Event	Icon on
F01	Fan is locked when inverter is off.	
F02	Over temperature or NTC is not connected well.	
F03	Battery voltage is too high.	
F04	Battery voltage is too low.	
F05	Output short circuited or over temperature is detected by internal converter components.	
F06	Output voltage is too high.	
F07	Over load time out.	
F08	Bus voltage is too high	
F09	Bus soft start failed	
F51	Over currents or urge	
F52	Bus voltage is too low	
F53	Inverter soft start failed	
F55	Over DC voltage in AC output	
F57	Current sensor failed	
F58	Output voltage is too low	
F59	PV voltage is over limitation	

5.5.2 Alarm Descriptions

➢ **Alarm:** The red LED flashes, and the LCD displays an alarm code, the inverter does not enter the failure mode

Alarm Indicator

Alarm Code	Alarm Event	Audible Alarm	Icon flashing
A01	Fan is locked when inverter is on.	Beep three times every second	A01 ⚠
A02	Over temperature	None	A02 ⚠
A03	Battery is over-charged	Beep once every second	A03 ⚠
A04	Low battery	Beep once every second	A04 ⚠
A07	Overload	Beep once every 0.5 second	A07 ⚠
A10	Output power derating	Beep twice every 3 seconds	A10 ⚠
A15	PV energy is low.	Beep twice every 3 seconds	A15 ⚠
A16	High AC input (>280VAC) during BUS soft start	None	A16 ⚠
A27	Max battery discharge current setting	None	A27 ⚠
E9	Battery equalization	None	E9 ⚠
bP	Battery is not connected	None	bP ⚠

5.5.3 Code Reference

Related information code will be displayed on LCD screen. Please check inverter LCD screen for the operation.

Code	Description
60 ⚠	If battery status is not allowed to charge and discharge after the communication between the inverter and battery is successful, it will show code 60 to stop charging and discharging battery.
61 ⚠	Communication lost • After battery is connected, communication signal is not detected for 1 minutes, buzzer will beep. • Communication lost occurs after the inverter and battery is connected successfully, buzzer beeps immediately.
69 ⚠	If battery status is not allowed to charge after the communication between the inverter and battery is successful, it will show code 69 to stop charging battery.
70 ⚠	If battery status must to charge after the communication between the inverter and battery is successful, it will show code 70 to charge battery.
71 ⚠	If battery status is not allowed to discharge after the communication between the inverter and battery is successful, it will show code 71 to stop discharge battery.

6.Trouble removeal

Problem	LCD/LED/Buzzer	Explanation/Possible cause	What to do
Unit shuts down automatically during startup process.	LCD/LEDs and buzzer will be active for 3 seconds and then complete off.	The battery voltage is too low (<1.91V/Cell)	1. Re-charge battery. 2. Replace battery.
No response after power on.	No indication.	1. The battery voltage is far too low.(<1.4V/Cell) 2. Internal fuse tripped.	1.Contact repair center for replacing the fuse. 2. Re-charge battery. 3. Replace battery.
Mains exist but the unit works in battery mode.	Input voltage is displayed as 0 on the LCD and green LED is flashing.	Input protector is tripped	Check if AC breaker is tripped and AC wiring is connected well.
	Green LED is flashing	Insufficient quality of AC power. (Shore or Generator)	1. Check if AC wires are too thin and/or too long. 2. Check if generator (if applied)is working well or if input voltage range setting is correct.(UP-->sppliance)
	Green LED is flashing.	Set “Solar First” as the priority of output source.	Change output source priority to Utility first.
When the unit is turned on, internal relay is switched on and off repeatedly.	LCD display and LEDs are flashing	Battery is disconnected.	Check if battery wires are connected well.
Buzzer beeps continuously and red LED is on.	Fault code 07	Overload error. The inverter is overload 105% and time is up.	Reduce the connected load by switching off some equipment.
		If PV input voltage is higher than specification, the output power will be derated.At this time, if connected loads is higher than derated output power, it will cause overload.	Reduce the number of PV modules in series or the connected load.
	Fault code 05	Output short circuited.	Check if wiring is connected well and remove abnormal load.
		Temperature internal converter component is over 120°C.	Check whether the air flow of the unit is blocked or whether the ambient tem perature is too high.
	Fault code 02	Internal temperature of inverter component is over 100°C	
	Fault code 03	Battery is over-charged	Return to repair center.
		The battery voltage is too high.	Check if spec and quantity of batteries are meet requirements.
	Fault code 01	Fan fault	Replace the fan.
	Fault code 06/58	Output abnormal (Inverter voltage below than 190Vac or is higher than 260Vac)	1. Reduce the connected load. 2. Return to repair center
	Fault code 08/09/53/57	Internal components failed.	Return to repair center.
	Fault code 51	Over current or surge.	Restart the unit, if the error happens again, please return to repair center.
	Fault code 52	Bus voltage is too low.	
	Fault code 55	Output voltage is unbalanced.	
	Fault code 59	PV input voltage is beyond the specification.	Reduce the number of PV modules in series.

7.Technical datasheet

Model			ISolar-SMT-4K-24V-Wifi
Input	Input Sources		L+N+PE
	Rated Input Voltage		220/230/240VAC
	Voltage Range		90-280VAC±3V(APL Mode)170-280VAC±3V(UPS Mode)
	Freqency		50Hz/60Hz(Auto Adaptive)
Output	Rated power	The battery inverts	3600W
		Photovoltaic inverter	3600W
	Output Voltage		220/230/240VAC±5%
	Output Frequency		50/60Hz±0.1%
	Waveform		Pure Sine Wave
	Transfer Time (adjustable)		Computers(UPS Mode)10ms, Appliance(APL Mode)20ms
	Peak Power		7200VA
	Overload capacity		Battery mode:11s@105%~150% Load;2s@150%~200% Load; 400ms@>200% Load
Grid-connected operation	Output Voltage		220/230/240VAC±5%
	Feed into the grid voltage range		100-280VAC
	Feed into the grid frequency range		47~53±1Hz/57~62±1Hz
	Nominal output current		15.7A
	Power Factor Range		>0.99
	Maximum conversion efficiency(DC/AC)		98%
Battery	Battery Voltage		24Vdc
	Constant Charging Voltage (Adjustable)		28.2Vdc
	Floate Charging Voltage (Adjustable)		27Vdc
Chargers	PV Charging Mode		MPPT
	MAX.PV Input Power		5000W
	MPPT Tracking Range		60~500Vdc
	Best voltage		300-400V
	MAX.PV Input Voltage		500Vdc
	PV Max Input Current		15A
	MAX.PV Charging Current		120A
	MAX.AC Charging Current		100A
	MAX.Charging Current		120A
Display	LCD interface		CAN display running mode/load/input/output,etc.
Interface	RS232		Baud Rate2400
	Extend the socket communication interface		Lithium Battery BMS Communication Card WifiCard
Environments	Operating Temperature		-10~50℃
	Humidity		20%~95%(Non-condensing)
	Storage Temperature		-15~60°C
	Altitude		Altiude Not Over 1000m,Derating over 1000m,Max 4000m, Refer to IEC62040
	Noise		≤50db
Standards and certification			EN-IEC 60335-1,EN IEC 60335-2-29, IEC 62109-1

1. Wireless Wi-Fi Distribution Network

1.1 APP Download

Method 1

Scan the QR code on the right, download the app.

Method 2

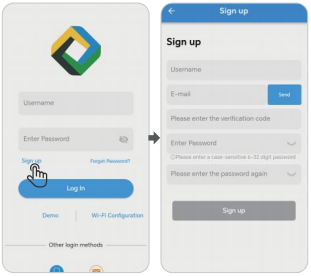
Scan the QR code of the film on the collector.

Method 3

Search in the application market to download the APP named "Solar of Things" for download.

1.2 Registered Account

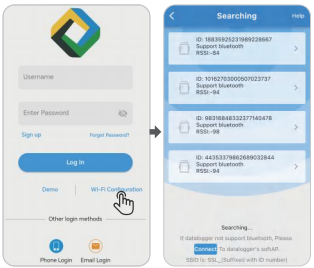
① On the App home page, click the "Sign Up" button, fill in the relevant information according to the prompt, and complete the registration.



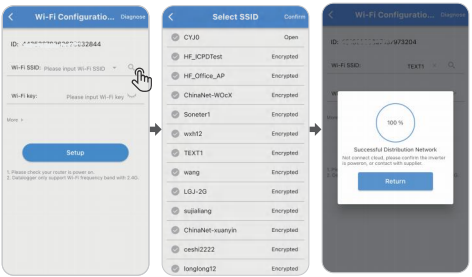
2. Supporting Network And Adding Device

2.1 Wi-Fi Collector Connection Router

① After the PWR indicator on the collector is on, turn on the mobile phone Bluetooth and Solar of Things App, click the "Wi-Fi Configuration" button to enter the "Searching" page, and the page will automatically display the nearby Bluetooth device.



② Select the collector that needs to be distributed, enter the matching webpage, and click the search icon. You can choose the Wi-Fi hotspot name.



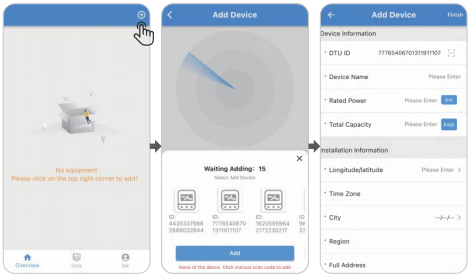
2.2 Add Device

Method 1

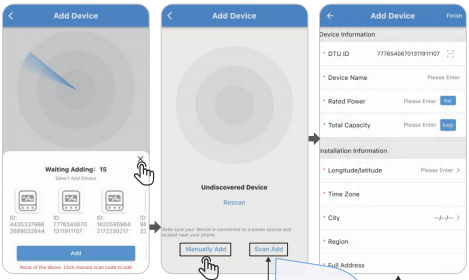
① Enter the homepage of the APP, click "+" in the upper right corner, enter the device to add the page, close the mobile phone close to the device, and the app scan the device automatically.

② After scanning to the device, select the ID that is consistent with the ID of the collector tag, and click "Add"

Note: Please confirm the collector ID before scanning. If the ID information is not found on the surface of the machine, you can view the ID on the matching page.



Method 2 "Manually Add", complete the adding device according to the interface prompt manual output collector ID, name and other information.

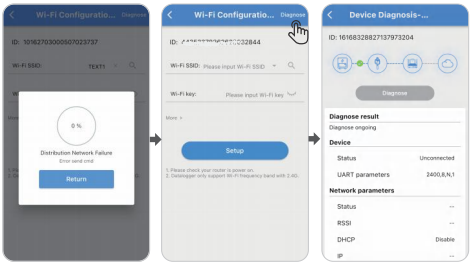


Method 3 "Scan Add", scan the QR code ID number of the collector film, and perform the device with the corresponding collector.

3. Collector Fault Diagnose And Indicator Light Judgment

3.1 Collector Fault Diagnose

① After the device distribution network is completed or failed, you can make a failure diagnosis by clicking on the upper right "Diagnose".



3.2 Collector Indicator Status

PWR (power indicator light):
On: normal power supply
Off: abnormal power supply

COM (serial port transmission indicator):
Off: Number of data interaction
Off for 0.3 seconds, on for 0.9 seconds: serial output data
Off for 0.3 seconds, on for 0.3 seconds: serial port receiving data
On: Two -way receiving and receivin

Net (network status indicator):
Off for 0.3 seconds, on for 3 seconds: STA mode connects the upper router
Off for 0.3 seconds, on for 0.3 seconds: STA is not connected to the upper router

SRV (server connection indicator):
On: Has been connected to the server
Off: Uninterrupted to the server